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10/580,091	05/18/2006	Jurgen Oetjen	188.613	7492
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EXAMINER				
DIAZ, THOMAS C				
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4171				
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

**Application No.**

10/580,091

**Applicant(s)**

OETJEN, JURGEN

**Examiner**

Thomas Diaz

**Art Unit**

4171

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 June 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SI/309)  
Paper No(s)/Mail Date 05/18/2006
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_

## DETAILED ACTION

### *Drawings*

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character:

- "a" has been used to designate both an angle in fig.1 and a distance in fig.2.
- "8" has been used to an unspecified area in fig. 1 and a 2<sup>nd</sup> nut part in fig.1.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

2. The drawings are objected to because:

- Reference numerals (4,5,13) in figure 1 are pointing to one location and referencing multiple parts. It is unclear how to distinguish the parts.

- Reference numerals (18,19), (27,8a), (20, 26) in figure 2 are pointing to one location and referencing multiple parts. It is unclear how to distinguish the parts.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

3. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the following features must be shown or the feature(s) canceled from the claim(s).

- In claims 4 and subsequent dependent claims from 4, the applicant claims a cage having belts which have webs and also claims pockets. These features are labeled in the drawings as the same thing. It is unclear to the examiner where exactly the features are shown. These features should be distinguished so that they are clearly shown in the figures.

No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Specification***

4. The disclosure is objected to because of the following informalities:

The disclosure is objected to because of the following informalities:

The specification should not directly reference claims, because the claims can change during the examination process. This problem first occurs page 2, line 15. The specification should include headings for the appropriate sections as described in CFR 37 § 1.77.

Appropriate correction is required.

***Claim Objections***

5. Claims 4, 10 and 12 are objected to because of the following informalities:

In claim 4 a coma should be entered after "having belts" in order to provide more clarity.

The following comas should be entered in claim 10. After "the spindle nut has two" a coma should be entered and after "first and second" a coma should be entered. Without the comas this claim could be read as having the spindle nut having four nut parts total, two of which being first nut parts and two of which being second nut parts.

In claim 12 the applicant recites "...two thread flanks of the thread groove are perpendicular to one another, the partial amount corresponding to approximately 30%..." The wording is confusing because it is slightly unclear

what the partial amount is referring to until the end of the claim. The examiner recommends moving "of the absolute value of the pitch" to be after "the partial amount".

***Claim Rejections - 35 USC § 112***

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claim 12 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. See MPEP § 2173.05(c). Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by "such as" and then narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949). In the present instance, claim 10 recites the

broad recitation "approximately 30%", and the claim also recites "preferably 28%" which is the narrower statement of the range/limitation. It is unclear which percentage the applicant is actually claiming. For purpose of examination, the examiner takes the offset of the pitches simply needs to be offset by a partial amount of approximately 30%.

***Claim Rejections - 35 USC § 102***

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Nishimura et al. (US patent 6481305).

Nishimura et al. discloses a similar roller screw to applicant's roller screw, both seen below:



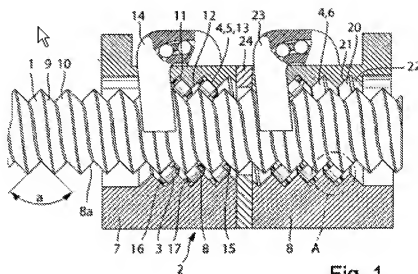


Fig. 1

Figure i- Applicant's roller screw.

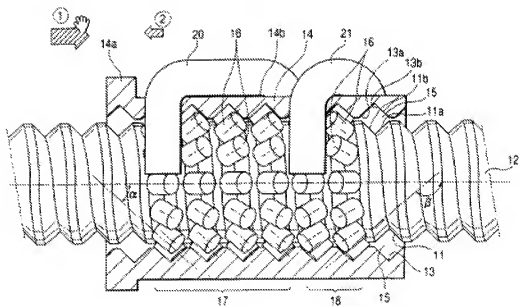


Figure ii- Nishimura et al.'s roller screw.

Regarding claim 1,

The applicant claims a roller screw with the following structure (Note the reference numerals within the parenthesis correspond to where the elements are located/recited in the prior art):

- A spindle nut (fig.1, 14) arranged on a threaded spindle (fig.1, 12),
- Rollers (fig.1, 16) which are arranged such that they can roll in a thread path (fig.1, 15),
- The thread path being delimited by thread grooves (fig.1,13, 11) provided on the threaded spindle and on the spindle nut,
- Wherein two equal pitches of the thread grooves are arranged so as to be axially offset with respect to one another by a partial amount of the pitch.

(This is seen in figure 2, below.)

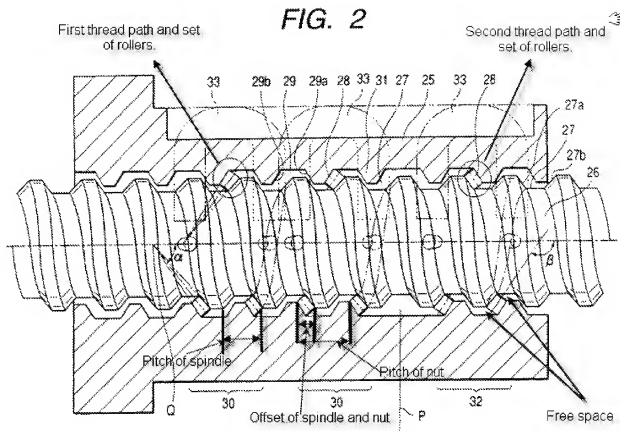


Figure iii- Nishimura et al.'s device.

**Claim Rejections - 35 USC § 103**

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 2, 7-9, 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishimura et al.

***Regarding claim 2,***

Applicant claims the following structure corresponding to Nishimura et al's structures:

- A spindle nut (fig.1, 14) arranged on a threaded spindle (fig.1, 12),
- Rollers (fig.1, 16) which are arranged such that they can roll in a thread path (fig.1, 15),
- The thread path being delimited by thread grooves (fig.1,13, 11) provided on the threaded spindle and on the spindle nut,
- Which thread grooves are each delimited by two thread flanks (fig.2, 29a and 29b for the nut, 27a and 27b for the screw),
- The rollers rolling on thread flanks, which face one another, of the two thread grooves (Please see rollers in fig.2, 28. They roll along opposing thread flanks that face one another),
- A free space being formed between end sides of the rollers and the thread flanks situated at opposite said end sides (Labeled in figure 2).

Nishimura et al. is silent to the following limitation of claim 1:

- Wherein the thread flanks are longer than the rollers

***Regarding claim 7,***

Applicant claims a roller screw having a first roller set arranged such that it can roll in a first thread path, and a second roller set arranged such that it can roller in a second thread path.

This is labeled in figure 2. Both sets of rollers are on different thread paths or different flanks.

***Regarding claim 8,***

Applicant claims the rotational axes of the rollers of the first set are arranged at an angle to the rotational axes of the rollers of the second roller set.

This is also clear from figure 2, according to the labels of the first and second sets of rollers made by the examiner.

***Regarding claim 9,***

Applicant claims the first roller set rolls on one thread flank of the thread groove of the threaded spindle and the second roller set rolls on the other thread flank of the thread groove of the threaded spindle.

This is also clear from the labeled portions in figure 2. Both sets roll on a different set of flanks.

***Regarding claim 12, as best understood,***

Applicant claims two thread flanks of the thread groove are perpendicular to one another, the partial amount of the absolute value of the pitch is approximately 30%.

The two thread flanks of the thread groove are perpendicular to each other as taught col.5, lines 64-67. From figure 2, the partial amount labeled is approximately 30% of the absolute value of the pitch.

It is clear that Nishimura et al. is silent to the thread flanks being longer than the rollers. However, based on how this device operates it would be necessary for the thread flanks of the nut and the thread flanks of the screw to be of equal size in order for the screw

and nut to rotate smoothly and symmetrically. As a result, rollers need to be of a shorter than the flanks otherwise the end portions of the rollers would contact the other flanks in the device and create issues such as frictional issues. Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to create the rollers of an appropriate size to avoid these issues. Furthermore, it would be obvious to optimize the size of the roller in order for it to bear the maximum amount of thrust load.

12. Claims 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nishimura et al. in view of Murata (USpgpub 20010038724) and.

***Regarding claim 3,***

Applicant claims the free space is formed as a lubricant reservoir.

Nishimura et al. fails to teach this.

*Murata teaches the following:*

***Regarding claim 3,***

Murata teaches a roller screw in which a large space is provided which is used for reserving lubricating oil in the circulation path, thus providing the rollers with sufficient lubrication (page 6, paragraph 66).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teachings of Nishimura et al. with the teachings of Murata to provide a roller screw with increased lubrication and decrease the friction generated.

13. Claims 4-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishimura et al. in view of Ise (US patent 6082210).

***Regarding claim 4,***

Applicant claims a cage wherein the rollers are held in pockets of said cage, the cage having belts and having webs connecting them to one another, the belts being arranged in the free space.

Nishimura et al. fails to teach this.

***Regarding claim 5,***

Applicant claims the belts arranged at a distance from one another, span one plane, the rotational axes of the rollers being arranged parallel to the plane and transversely with respect to the belts.

Nishimura et al. fails to teach this.

***Regarding claim 6,***

Applicant claims the webs and the free space loop around the rotational axis of the roller screw drive in the manner of a screw.

Nishimura et al. teaches that the free space shown in figure 2 loops around the rotational axis of the roller screw.

Nishimura et al. fails to teach the webs and how they loop around. It is clear that Nishimura et al. fails to teach the cage, belt and webs claimed by applicant and how these elements are arranged.

*Ise teaches the following:*

**Regarding claim 4,**

Ise teaches a cage (fig.1, 1) having belts (fig.1, 4) and webs (fig.1, 5) which connect the rollers to each other. This structure is used to provide smoother circulation of the rollers (col.2, lines 30-33).

**Regarding claim 5,**

Ise teaches the belts arranged at a distance from one another and span one plane, the rotational axis of the rollers being parallel to the plane and transversely with respect to the belts as seen in fig. 10.

**Regarding claim 6,**

Ise teaches the web looping around the rotational axis of the roller screw drive in the manner of a screw as seen in figure 4 for the purpose of connecting all the rollers.

Fig. 1

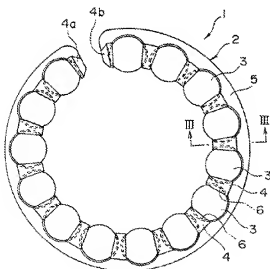


Fig. 4

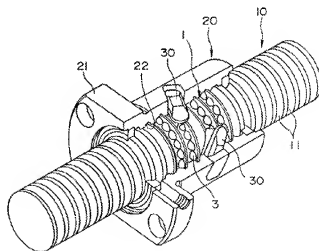




Fig. 10

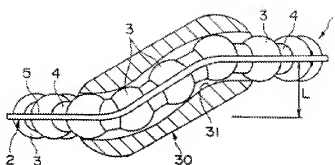


Figure iv- Ise's device.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of then invention to combine the teachings of Ise with the teachings of Nishimura et al. in order to provide a roller screw in which all the rollers are connected and to provide smoother roller circulation as discussed above.

14. Claims 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishimura et al. in view of Greby (US patent 3192791).

**Regarding claim 10,**

Applicant claims the spindle nut having two nut parts arranged one behind the other axially, the first roller set arranged in one part and the second arranged in the other part.

Nishimura et al. fails to disclose 2 nut parts.

**Regarding claim 11,**

Applicant claims a spacer which keeps the two nut parts an axial distance from each other and defines an axial distance dimension which is such that the nut parts are kept in a prestressed state with the threaded spindle.

Nishimura et al. fails to disclose this spacer as well.

It is clear that Nishimura et al. fails to teach two nut parts and a spacer between them.

*Greby teaches the following:*

**Regarding claim 10,**

Greby teaches nut parts both labeled 26a in figure 8 and mentioned col.5, lines 24-29, where Greby further discusses these nut parts allow for sustaining thrust loads in two directions.

**Regarding claim 11,**

Greby teaches a spacer (fig.8, 76) for the purpose of preloading the rollers and eliminate axial play of the nuts on the screw (col.5, lines 35+). This shim can be adjusted.

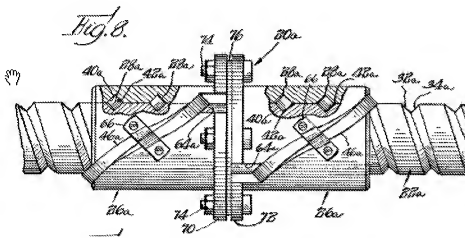


Figure v- Greby's roller screw.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Greby with the teachings of Nishimura et al. in order to provide a roller screw capable of sustaining heavy thrust loads in two directions and having eliminating backlash.

### ***Conclusion***

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Prior art has similar roller screws, some have related caging system.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas Diaz whose telephone number is (571)270-5461. The examiner can normally be reached on off. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Larry Tarazano can be reached on (571)272-1515. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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Supervisory Patent Examiner, Art Unit 4171

Thomas Diaz  
Examiner  
Art Unit 4171